100% DESIGN SUBMITTAL

DESIGN ANALYSIS

FOR

E85 FUELING STATION

VA MEDICAL CENTER
HUNTINGTON , WV

PROJECT NO. 581-305
CONTRACT NO. VA 701-12-D-028

Prepared By:

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Shelbyville, Kentucky

August 8, 2013

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APPENDIX

I. SITE LAYOUT

A. GENERAL PARAMETERS

1. The E85 site is located in area south of the Maintenance Shop B19 with a 5,000 gallon above grade E85 tank, access for two fuel dispensers, and a canopy over the dispensing areas. See images in appendix of the existing site and proposed layout.

B. FUNCTIONAL AND TECHNICAL DATA

1. Design Criteria.

   a. VA Design Manual PG-18
   b. Project 581-305 E85 Fueling Station Statement of Work
   c. Commercial fuel delivery truck accessibility
   d. Straight SU30 truck accessibility to dispensers

C. DESIGN PROVISIONS

1. Access to E85 Site. Access to and from the E85 site will be across drives and parking areas being developed as part of a separate project entitled "Renovation to the Former BRAC Property". Design documents for the project at 60% Submittal were provided for reference. This E85 project assumes that provisions are/will be included in the BRAC project for the proper access for vehicles, including commercial fuel delivery trucks, to and from the E85 site

2. E85 Site. Layout of the E85 site provides for vehicles entering the west end of the site located south of Maintenance Shop Bldg 19, and exiting the site heading east and around the east end of Bldg 19. In order for turning movements of the fuel delivery truck, and larger straight unit truck/vans, the gravel surface area south of Bldg 19 will need to be enlarged by excavating into the embankment and construction of a retaining wall. See appendix for commercial fuel delivery trunk access turning movement onto and thru the site

3. Fueling Station Layout Options: Layout of the fuel dispensing island provides for dispensing of fuel to a vehicle with tank fill location on either the left or right side of the vehicle. Fuel delivery point of connection is at west end of tank.

4. Site Perimeter Fence: A perimeter fence will be provided around the E85 site for security of the site during off hours In order to provide for turning movements of the larger vehicles and commercial fuel delivery truck, large gates are required at point of entry onto the E85 Site as indicated on drawings. While the facility is open for use, the gate will be held in open position and swing against the tank island to provide for maximum maneuvering space approaching the fueling station and will add some protection for the tank. Use of cantilever or roller gates are not practical given the physical constraints adjoining the E85 site.

II. CIVIL

A. GENERAL PARAMETERS

1 Work includes miscellaneous site removals, paving and grading and drainage for the new E85 fueling station.

B. FUNCTIONAL AND TECHNICAL DATA

2. Design Criteria.

   a. VA Design Manual PG-18
   b. Project 581-305 E85 Fueling Station Statement of Work

C. DESIGN PROVISIONS

1. Removals. The following items require removal:

   a. Fence along south side of site
   b. Gravel surface lot.

2. Pavements. All pavements and drives associated with the E85 site will concrete pavement

3. Existing Drainage. The existing 12 inch drain discharging into the existing swale at the base of the hill south of the site will be intercepted and reroute around the new retaining wall. In area of the E85 site, the existing swale along the existing fence line will be abandoned. Offsite drainage to the south will be collected in a paved swale on the back side of the retaining wall and prevented from flowing onto the E85 site

4. On-Site Drainage. The E85 concrete pavement within the fenced in area will slope and drain to an inlet structure located along the retaining wall with pipe discharge to the existing swale. Off-site storm water will be diverted and prevented from flowing onto the E85 site

5. Spill Control. . The pipe discharge pipe from the inlet structure will be provided with a valve and post indicator to allow closing off flow from the site for containment of potential spills during the tank filling process. Volume within the inlet structure and on pavement surface will provide for containment of a minimum of 2,500 gallon fuel spillage from a compartment of the delivery vehicle truck

III. STRUCTURAL

A. GENERAL PARAMETERS

1. The structural system will provide for the support of the E-85 tank, canopy, and retaining walls

B. FUNCTIONAL AND TECHNICAL DATA

1. Design Criteria

   a. Design Code-WV/International Bldg Code:
   - International Building Code (IBC)

   b. Design Loading
   - Basic Wind Speed = 90 MPH, Exposure C
   - Ground Snow Load = 20 PSF
   - Seismic Spectral Response Accelerations:
     S_S = 0.200 g, S_1 = 0.073 g (For Zip Code 25704)
     Site Class = D (No Soil Report)
     S_{DS} = 0.160 g, S_{D1} = 0.082 g

2. Materials: The design is based on the following:

Allowable Soil Bearing	2000 PSF (verify in field)
Concrete:	f'_c @ 28 days – 3,000 psi
Reinforcing	ASTM A-615, Grade 60

C. DESIGN OBJECTIVES

1. Foundation system will be a spread footing system. Foundations will extend a minimum of 42 inches below grade.

2. Spread footings are proposed to distribute the vertical dead loads and to resist overturning from wind and seismic loads.

3 Retaining walls are proposed to retain the soil behind the wall. The retaining walls approximately will have 12" wall with 7'. The height of the wall varies. Sleeves will be embedded at top of the wall to receive the fence poles.

4 Canopy: At this stage it is recommended that canopy structure be made of steel rather than aluminum. Even though aluminum is almost as strong as steel, it's stiffness is about one third of steel, resulting in excessive deflection and therefore requiring more columns in the case of this type canopy with vehicular access. The canopy will have 14'-6" of clearance for truck access. Both 24' x 24' and 32' x 32' canopies have been considered for this project. The 24' x 24' canopy will have only two columns and the 32' x 32' will have four columns. The canopy will have aluminum fascia. See attached typical manufactures data for canopy.

IV. FUELING STATION

A. GENERAL PARAMETERS

1. A 5,000 gallon above ground tank, two fuel dispensers, card reader/fuel management and monitoring system, and canopy will be provided.

B. FUNCTIONAL AND TECHNICAL DATA

1. Design Criteria

   a. VA Design Manual PG-18
   b. Project 581-305 E85 Fueling Station Statement of Work
   c. NFPA 30A-Motor Fuel Dispensing

C. DESIGN PROVISIONS

1. E85 TANK: An above ground 5,000 gallon tank will be provided and located minimum of 25 feet from the Maintenace Shop Bldg 19. . The tank will be a double wall tank, providing 110% containment of maximum fuel stored, impact and ballistic resistant and internally insulated to provide a 2 hour fire rating. Interstitial monitoring of the tank will be provided and alarmed if fuel or water is detected in the interstitial tank space. Tank will be provided with factory saddles for mounting to a concrete foundation pad. Attached in appendix is typical manufactures data for tank.

2. Dispensers: Two fuel dispenser for E85 fuel will be provided. Dispensers will be located such that filling to left or right side of vehicle can be accommodated.

3. Card Reader/Fuel Management System. A single card reader with fuel management system will be provided for monitoring of fuel dispensed and delivered. Vehicle ID, odometer reading, and date will be recorded.

4. Fuel Delivery Station: Dry break coupling connections for fuel delivery and vapor recovery during delivery will be provided with drip containment enclosure. An onsite fuel pump is provided. Over the road delivery truck are not all provided with on-board fuel pumps, as typical delivery is by gravity dump to below grade tanks.

V. ELECTRICAL

A GENERAL PARAMETERS

1. Electric power and low voltage systems will be provided in support of the E85 Fueling Station: 5,000 gallon above ground tank, two fuel dispensers, and canopy. Systems will include – lighting, card reader/fuel management, security, emergency telephone and leak detection monitoring.

B. FUNCTIONAL AND TECHNICAL DATA

1. Design Criteria

   a. VA Design Manual PG-18
   b. Project 581-305 E85 Fueling Station Statement of Work
   c. NFPA 70 National Electric Code

C. DESIGN PROVISIONS

1. Electric Service: Electric service for the E85 Fueling Station will originate from the adjacent Garage, former BRAC Property, currently being designed for renovations. Fuel Station design will include a dedicated panelboard to serve fuel station loads. Circuits serving the fuel station will be routed underground. Overcurrent protection and disconnecting means as required by Code, VA Standards/Guidelines and equipment manufacturer requirements will be provided at each load. The electric system will include an emergency shutdown with audible/visual alarms.

2. Area Lighting: Illumination for the E85 Fueling Station will be provided by pole mounted fixtures installed on metal standards with HID lamps and automatic photoelectric control for dusk to dawn operation.

3. Data/Communications: A fiber optic circuit will be installed outside this Project from the VA Hospital to the Garage adjacent to the fueling station. A data/communication rack will be established as part of the fiber optic installation in the Garage. All low voltage data and communication systems associated with the fueling station will terminate at the data/communication rack.

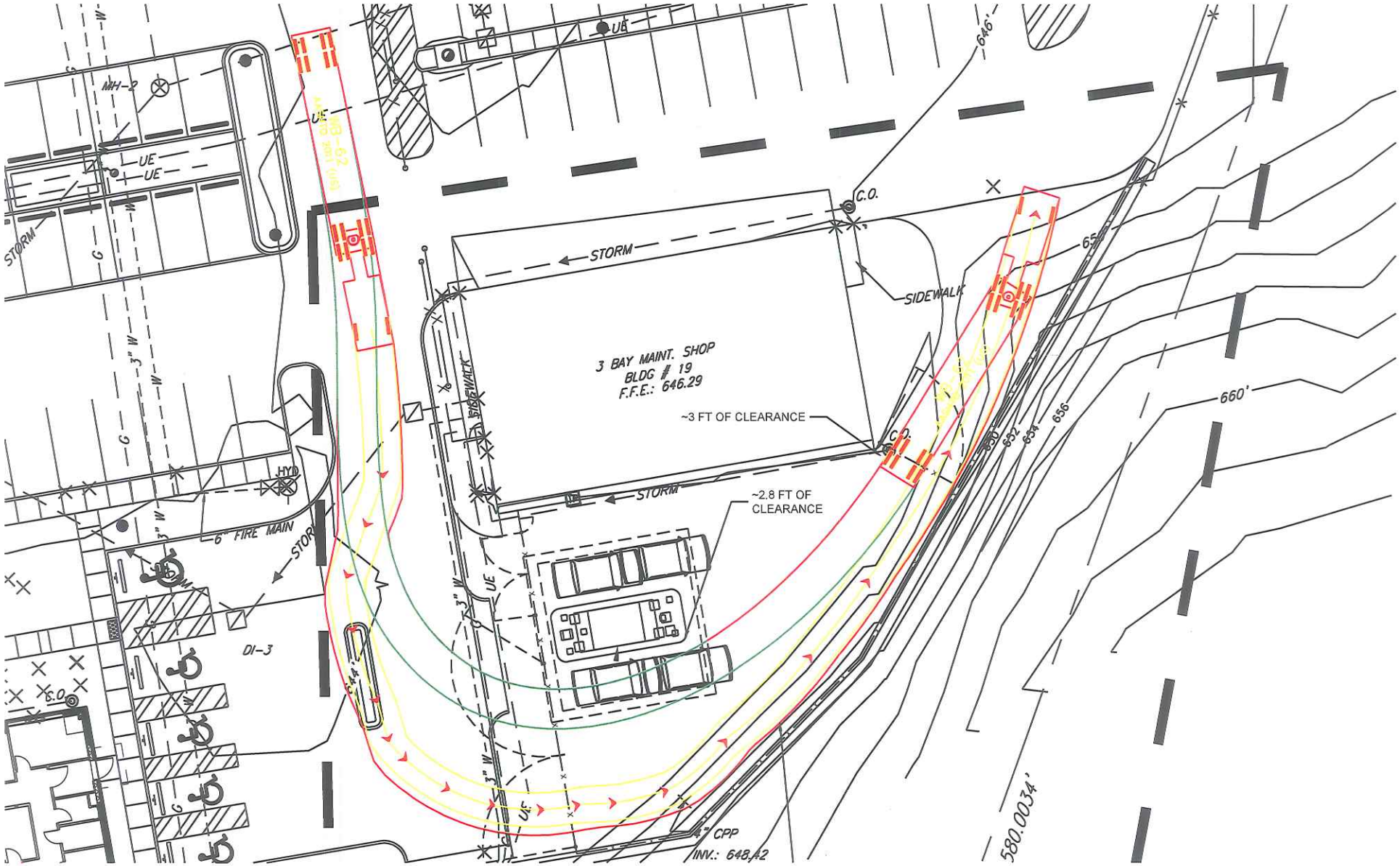
4. Systems: Low voltage systems associated with the E85 Fueling Station will include - card reader/fuel management, on-demand monitoring and reporting, security cameras, emergency telephone, leak detection and spill monitoring sensors. Security cameras and the emergency telephone will be monitored at the existing VA Medical Center Police Station.

5. Provisions for Future: Design will include a minimum of two spare conduits for each conduit required for power and low voltage systems wiring. Each spare conduit shall include a pull string and will be of the same size and type as utilized conduits.

APPENDIX

Google earth

feet 500
meters 100



E-85 FUELING STATION 05.30.13

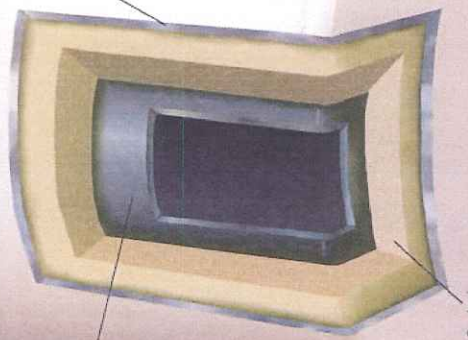
HUNTINGTON VA MEDICAL CENTER

GUIDON DESIGN

FIREGUARD® is the New Generation

of fire-rated ASTs, going far beyond those "first generation" tanks which were merely enclosed in concrete.

- Fireguard® was the first AST of its design to obtain a UL Listing for secondary containment.
- Fireguard®'s secondary containment can be tightness tested on-site with standard testing procedures!
- Fireguard®'s exterior steel wall provides superior weatherability and low-cost maintenance. Unlike concrete, cracking or spalling will never be a problem!
- Fireguard®'s unique thermal insulating material is 75% lighter than concrete... shipping, installation and relocation costs are reduced!
- The Fireguard® technology is patented under U.S. Patent #5695089 and #5809650 for "Lightweight Double Wall Storage Tank."
- Fireguard® is a UL approved core component for the 2244 system listing



Lightweight thermal insulation

- Unique feature that helped Fireguard® exceed the UL 2-hour fire test
- Sufficiently porous to facilitate quick emergency venting and/or leak detection

FIREGUARD® TANKS ACCOMMODATE EVERY SITE REQUIREMENT:

- Significantly more size options than most competitive brands
- Capacities range from 186 to 50,000 gallons
- Cylindrical or rectangular design
- Compartmentalized configurations
- Ballistics resistant
- Impact resistant
- Support designs available for seismic zones 0 through 4

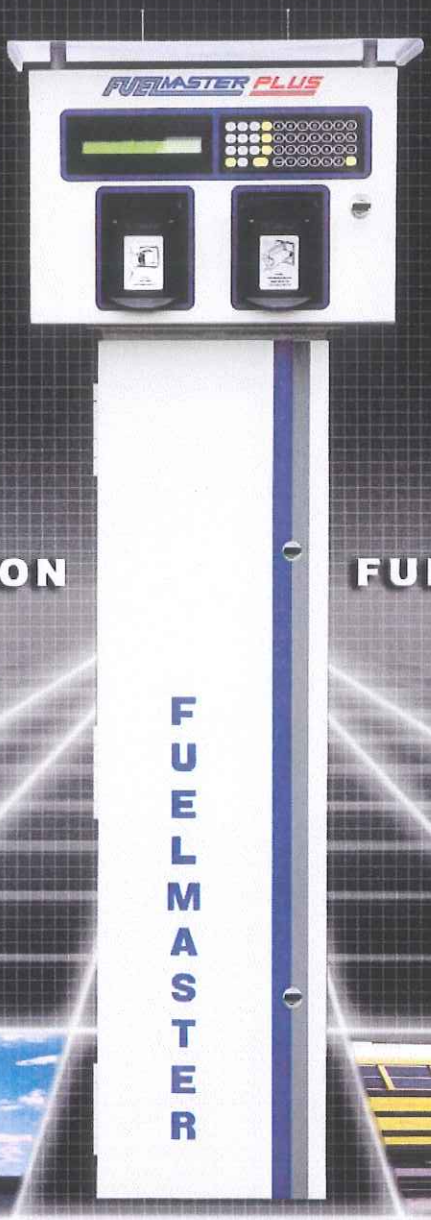
IS YOUR ABOVEGROUND TANK EVERYTHING IT'S CRACKED UP TO BE?

FIREGUARD	vs.	Concrete Encased
• Secondary containment is testable on-site using standard, economical testing procedures.		• The secondary containment on certain designs may require elaborate and expensive procedures to be tested on-site.
• Fireguard®'s steel outer wall provides low-cost maintenance and protects the insulation material from weathering.		• Exposed concrete outer wall is susceptible to cracking, spalling and weathering - problems that are expensive to correct and are usually not covered by warranty.
• An average 12,000 gallon Fireguard® weighs under 30,000 pounds - well within the legal load limit for trucking.		• An average 12,000 gallon concrete-encased tank weighs upwards of 100,000 pounds - imagine the hassles involved in handling that tank.

GSA Federal Supply Schedule GSA FSS Contractor

Contract Number: GS-07F-0134K
FSC Group 54, Part III
Aboveground Storage Tanks/Systems
FSC Classes: 5430

FuelMaster® 2500 Plus



NEXT GENERATION FUEL MANAGEMENT

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SYN-TECH SYSTEMS, INC.

www.syntech-fuelmaster.com

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marketing@syntech-fuelmaster.cor

Benefits

The best just keeps getting better! ***FueMaster***® saves you money by eliminating manual tracking of fuel transactions and increasing accountability. The same reliable ***FuelMaster***® equipment that's been the fleet managers' choice for years has been upgraded to increase productivity and provide a quicker return on investment...usually within the first year!

FuelMaster® engineers and technicians provide the best product support service in the industry. Toll-free support directly to your fuel island, as well as PC to PC training and assistance, saves you time and money. ***FuelMaster***® doesn't stop there! Its flexibility permits numerous, diverse uses; e.g., a gate opener, car wash activator, or controlling access to chemicals, to name a few. Consider a ***FuelMaster***® **Fuel Management System** ...and start saving money today!

The ***FuelMaster***® 2500 Plus series adds additional features that make it the most effective fuel management system on the market for many years to come. Flash memory has been added to permit updating the fuel island operating system without changing chips. The Plus system has increased memory and processor speed and the database has been upgraded to Access 2000. The Plus system also supports a network card to permit Internet access. ***FuelMaster***® software now has more flexibility in the customization of reports. ***FuelMaster***® also communicates directly with electronic dispensers to permit interfaces with blended MPDs and the capability of remotely changing dispenser prices.

Features

Electronic Read/Write keys and cards are great for fleet operations or gas club members. PROKEE®s are high strength, plastic composite keys containing nonvolatile, read/write memory chips, which can be encoded with confidential information to control access to dispensers and streamline product transaction data.

FuelMaster®'s patented **radio frequency tag system** takes driver data entry out of the information collection equation. The odometer or chronometer data, along with other information is automatically collected by the island fuel management unit without driver effort. An AIM (automotive information module) unit is installed on the equipment and collects and stores information and sends it to the fuel management unit by RF during fueling operations. This system works concurrently with the use of PROKEE®s or smart cards so that the (AIM) units may be added to equipment currently using electronic read/write access devices.

The ***FuelMaster***® 2500 Plus' capabilities to support **self-serve retail applications** have also been increased. As well as being on an ever increasing number of credit card networks, prepaid smart cards and PROKEE®s can be issued to customers. The system operator may also enter up to 300 credit card numbers of repeat customers with a specified discount for each. The Plus system also returns more credit card information and settle-up data to the PC software for easier tracking of fuel purchases.The ability to price fuel at multiple remote sites has been enhanced to ensure you're in control of your fuel.

A real-time, on-site **journal printer** can provide hard copy backups of all transactions. A **receipt printer** is also available.

FuelMaster® is a leader in the **alternative fuels** arena... from CNG to E85! ***FuelMaster***® can control and measure any liquid or gaseous fuel. Leaders in the alternative fuels field chose ***FuelMaster***® because of its reliability and ease of maintenance.

Based on **odometer/hour readings**, the system calculates vehicle efficiency and fuel consumption and alerts the driver and supervisor to maintenance requirements.

The addition of a **tank monitor interface kit** permits automatic reconciliation of tank levels with ***FuelMaster***®'s declining balance. ***FuelMaster***® interfaces with most popular tank monitors.

The ***FuelMaster***® system may be expanded to control an almost limitless number of fueling sites. Each site consists of a master unit with up to eight satellites.

FuelMaster® is warranted for one year from date of installation or fifteen months from date of shipment.

Modular design and construction ensure reliability and ease of maintenance of your ***FuelMaster***® Fuel Management System. Site operators can quickly and easily change-out modular components, if necessary, with the assistance of ***FuelMaster***® technicians.

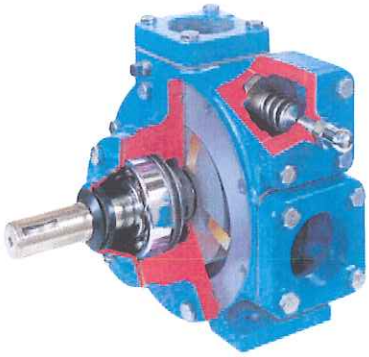
The central controller (a PC operating on **Windows 98 or higher**) generates comprehensive transaction reports and invoices.

Transaction data can be easily exported to most **fleet maintenance programs**.

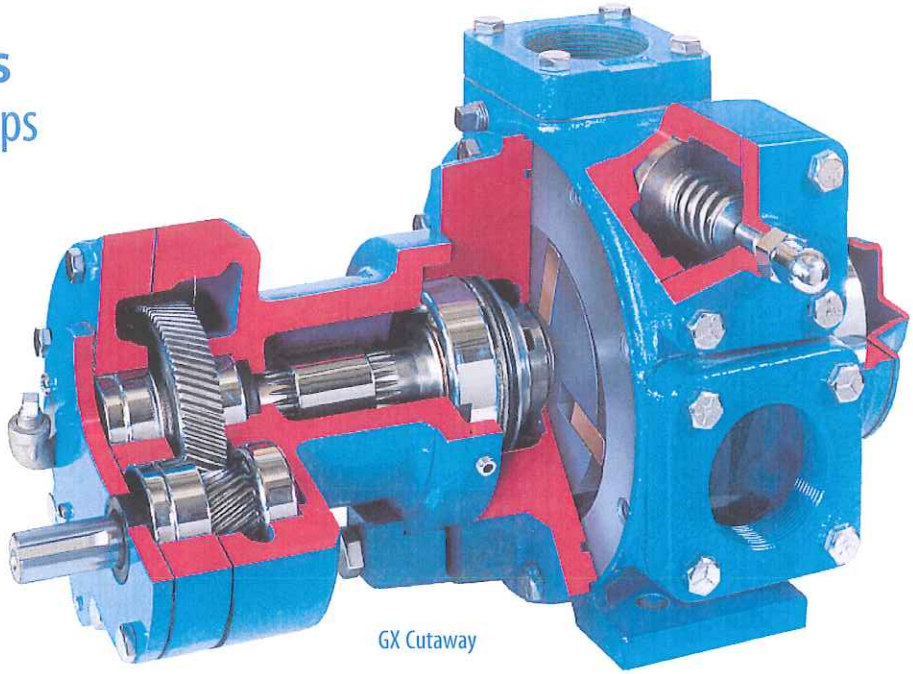
If you are looking for reliability and flexibility, look no further. The purchase price is only part of what you pay for a fuel management system. Repairs and system downtime also cost you money, making reliability a key ingredient in achieving return on your investment. We encourage you to talk with ***FuelMastser***® owners, particularly those who have previously used other brands of fuel management.

Spec Sheet 101-003
Section: 101
Effective: January 2012
Replaces: November 2009

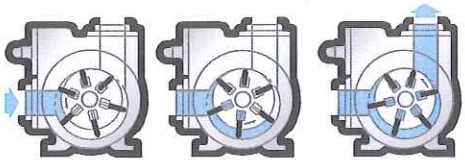
GX & X Series
General Duty Pumps



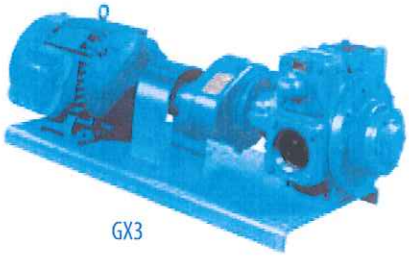
X2 cutaway



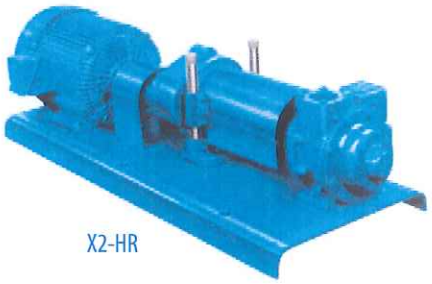
GX Cutaway



How Blackmer's sliding vane action works



GX3



X2-HR

Design

Blackmer's GX and X series models are available in 2, 2.5, 3 and 4-inch flanged port sizes with capacities from 30 to 520 U.S. gpm (114-1,855 L/min). Cast iron construction is standard on all models except the X4 model which is ductile iron construction. All models have external ball bearings isolated from the pumpage by mechanical seals.

The GX type pumps feature an integral head-mounted gear reduction drive with oil lubricated, hardened helical gears that provide quiet trouble-free operation. Gear shafts are supported at both ends by ball bearings for smooth operation and long life.

A splined shaft simplifies alignment of the pump and reducer, and the reducer can be rotated on the pump head to accommodate a variety of motor sizes without shimming.

Application

Blackmer's GX and X type pumps are designed to handle a wide range of non-corrosive, non-abrasive industrial liquids and petroleum products. Typical applications include fuel oils, lube oils, jet fuels, gasoline, edible oils and a variety of solvents and thinners such as esters, ketones, naphthas, ethers, amines, aromatics, alcohols, terpenes, glycols and many other similar liquids.

Benefit

Blackmer's positive displacement rotary pumps utilizing their unique sliding vane design offers the best combined characteristics of sustained high level performance, energy efficiency, trouble-free operation and low maintenance cost. Also, the high suction lift capability of these pumps makes them especially suitable for pumping from underground tanks, bulk plant service and aircraft refueling.

Performance Data*

Pump Model	GX2, X2				GX2.5, X2.5				GX3, X3				GX4, X4				
Rated Pump Speed (rpm)	640	520	420	350	640	520	420	350	640	520	420	350	500	400	300	230	190
U.S. gpm	70	55	44	36	121	96	76	63	270	220	177	146	507	404	299	225	190
L/min	264	210	165	135	461	363	288	237	1023	835	671	544	1919	1532	1135	855	695
hp	3.2	2.6	2.0	1.7	4.7	3.7	2.9	2.4	11.2	8.5	6.5	5.2	20.8	15.9	11.5	8.6	7.0

* Approximate capacities and horsepower (HP) are based on a 100 ssu (22 cSt) fluid at a 50 psi (3.45 bar) differential pressure.
Refer to Characteristic Curves for capacities and horsepower at other pressures and viscosities.
Centipoise (cP) = Centistokes (cSt) at fluid specific gravity of 1.0

Maximum Operating Limits

Pump Model	Maximum Pump Speed			Minimum Pump Speed			Maximum Differential Pressure	Maximum Working Pressure	Maximum Operating Temperature
	Speed	Flow[2]	Viscosity[3]	Speed	Flow[2]	Viscosity[3]			
	rmp	gpm (L/min)	ssu (cSt)[4]	rpm	gpm (L/min)	ssu (cSt)[4]	psi (bar)	psi (bar)	°F (°C)
GX2[1]	780	87 (329)	100 (22)	190	20 (76)	20,000 (4,250)	125 (8.6)	175 (12.1)	300 (149)
X2	780	87 (329)	100 (22)	68	7 (26)	20,000 (4,250)	125 (8.6)	175 (12.1)	300 (149)
GX2.5	780	155 (587)	100 (22)	190	33 (125)	20,000 (4,250)	125 (8.6)	175 (12.1)	300 (149)
X2.5	780	155 (587)	100 (22)	68	12 (45)	20,000 (4,250)	125 (8.6)	175 (12.1)	300 (149)
GX3[1]	640	270 (1,022)	100 (22)	125	46 (174)	20,000 (4,250)	125 (8.6)	175 (12.1)	300 (149)
X3	640	270 (1,022)	100 (22)	68	28 (106)	20,000 (4,250)	125 (8.6)	175 (12.1)	300 (149)
GX4[1]	520	528 (1,999)	100 (22)	100	90 (341)	20,000 (4,250)	125 (8.6)	175 (12.1)	300 (149)
X4	520	528 (1,999)	100 (22)	68	66 (250)	20,000 (4,250)	125 (8.6)	175 (12.1)	300 (149)

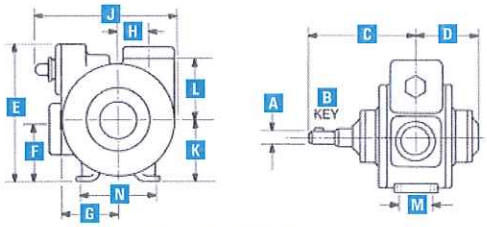
[1] GX pump models are limited by gear reducer capability (pressure / rpm / viscosity dependent).
[2] Flow is normal at 50 psi (3.45 bar) differential pressure.
[3] Viscosity listed is maximum. Blackmer GX and X pump models are also well suited for viscosities less than 31 ssu (1 cSt).
[4] Centipoise (cP) = Centistokes (cSt) at fluid specific gravity of 1.0
Note: Optional materials of construction may be required to meet specific application requirements – refer to Blackmer Material of Construction Sheet 101-095.

Pipe Companion Flanges

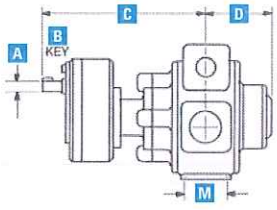
Pump Model	Standard	Optional
GX2[1], X2	2" NPT	2" Blackmer Weld
		2" ANSI**
GX2.5, X2.5	2.5" NPT	2.5" Blackmer Weld
		3" ANSI**
GX3, X3	3" NPT	3" Blackmer Weld
		3" ANSI**
GX4, X4	4" NPT	4" Blackmer Weld
		4" ANSI**

** ANSI Compatible flanges are Raised Flat Faced.

Dimensions



GX and X Pump Models



GX Pump Models

Pump Model		A	B	C	D	E	F	G	H	J	K	L	M	N	Approx. Wt. with Std. Flanges
GX2	in.	3/4	3/16	11 9/16	5 3/8	8 11/16	3 1/2	4	1 1/2	9 3/4	4	4 1/8	1 5/8	5	110 lbs.
	mm	–	–	294	137	221	89	102	38	248	102	105	41	127	50 kg
GX2.5	in.	3/4	3/16	12 5/16	6	9 5/8	3 3/4	4 5/16	1 3/4	10 11/16	4	5 1/16	3	5 1/2	130 lbs.
	mm	–	–	313	152	244	95	110	44	271	102	129	76	140	59 kg
GX3	in.	1	1/4	14 1/2	6 1/2	12 3/16	4 5/8	5	2 1/2	13 3/8	5 3/8	5 1/4	2 1/2	6	230 lbs.
	mm	–	–	368	165	310	117	127	64	340	137	133	64	152	104 kg
GX4	in.	1 1/8	1/4	18 5/8	8 1/8	15 1/2	5	7 3/8	2 1/2	16 7/8	6 3/8	8	4 1/2	8	430 lbs.
	mm	–	–	473	206	394	127	187	64	429	162	203	114	203	195 kg

Pump Model		A	B	C	D	E	F	G	H	J	K	L	M	N	Approx. Wt. with Std. Flanges
X2	in.	1 1/8	1/4	8	5 3/8	8 11/16	3 1/2	4	1 1/2	9 3/4	4	4 1/8	1 5/8	5	110 lbs.
	mm	–	–	203	137	221	89	102	38	248	102	105	41	127	50 kg
X2.5	in.	1 1/8	1/4	8 3/4	6	9 5/8	3 3/4	4 15/16	1 3/4	10 11/16	4	5 1/16	3	5 1/2	130 lbs.
	mm	–	–	222	152	244	95	110	44	271	102	129	76	140	59 kg
X3	in.	1 1/8	1/4	9 5/8	6 1/2	12 3/16	4 5/8	5	2 1/2	13 3/4	5 3/8	5 1/4	2 1/2	6	230 lbs.
	mm	–	–	244	165	310	117	127	64	340	137	133	64	152	104 kg
X4	in.	1 1/2	3/8	11	8 1/8	15 1/2	5	7 3/8	2 1/2	16 7/8	6 3/8	8	4 1/2	8	430 lbs.
	mm	–	–	280	206	394	127	187	64	429	162	203	114	203	195 kg

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THE RED JACKET SUBMERSIBLE TURBINE PUMP AG

Description (/us/products/red-jacket-submersible-systems/red-jacket-submersible-turbine-pump-ag?quicktabs_np001=des

Benefits (/us/products/red-jacket-submersible-systems/red-jacket-submersible-turbine-pu...ne-pump-ag?quicktabs_np001=benefits

Specs (/us/products/red-jacket-submersible-systems/red-jacket-submersible-turbine-pump...pump-ag?quicktabs_np001=specs#qui

Documents (/us/products/red-jacket-submersible-systems/red-jacket-submersible-turbine-...turbine-pump-ag?quicktabs_np001=doc

Related Information (/us/products/red-jacket-submersible-systems/red-jacket-submersible-...bmersible-turbine-pump-ag?quicktabs_

ASK ABOUT OTHER APPLICATIONS FOR THIS PRODUCT:

AG Fuel Compatibility:

- Ethanol or Methanol concentrations up to 100%
- MTBE, ETBE or TAME concentrations up to 20%

Designed for Hazardous Location:

- Class 1, Group D atmospheres

Quick-Set Telescoping Pipe Adjustment Range:

- RJ 1 = 74.5" - 105"*
- RJ 2 = 104.4" - 165"
- RJ 3 = 164" - 225"
- *Assumes 1.5 HP

Agency Listings (See the price book and manual for agency listings by model):

- UL – 100% Diesel, 100% Gasoline, Gasoline up to 10% Ethanol, 15% Methanol, 20% MTBE, 20% ETBE, 20% TAME
- cUL
- ATEX EN15268 Certified

4" Horsepowers Available:

- 3/4 HP, 60 HZ, 1-phase
- 3/4 HP, 50 HZ, 1-phase or 3-phase
- 1 1/2 HP, 60 HZ, 1-phase
- 1 1/2 HP, 50 HZ, 1-phase or 3-phase
- X3, 60 HZ, 1-phase
- X4, 50 HZ, 1-phase or 3-phase
- 2 HP, 60 HZ, 1-phase

Siphon Ports:

- 2 available, 1/4" NPT. Vacuums
- generated up to 25 in Hg.
- Line Pressure Port:
- 1 Available. 1/4" NPT

Vent Port:

- 1 Available. 1/4" NPT

PNEUMERCATOR
Liquid Level Control Systems

TMS 2000

Tank Management System with EPA-compliant in-tank leak detection

TMS 2000 series UST/AST Tank Management System.

A truly low cost, high performance solution designed to meet all of your environmental compliance and inventory management needs. Complete with every feature you need, the TMS 2000 has a simple, user-friendly interface.

Get ADOBE READER

Click here to download the Acrobat Reader if it is not already installed on your system

Click

Download Suggested Specifications for the TMS 2000

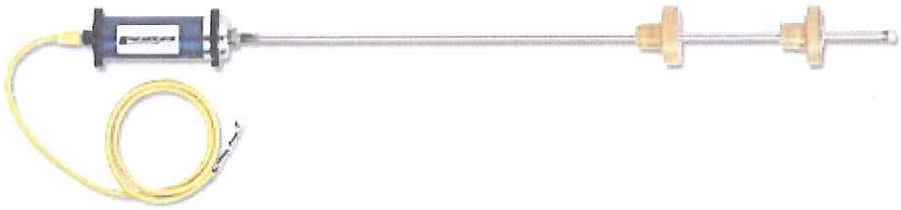
- Extremely flexible, modular system architecture. Completely field configurable and upgradeable.
- Support for up to 2 precision, dual float magnetostrictive level probes.
- Provisions for monitoring up to 8 intrinsically safe discrete sensor inputs, including discriminating and non-discriminating interstitial, overfill, and secondary leak containment sensors. Sensor wiring fault detection feature ensures correct installation when used with Pneumercator "F" series fault output discrete sensors.
- Basic configuration includes 2 relays and 2 contact
- Third party certified for 0.1 and 0.2 gph in-tank leak detection in tanks up to 75,000 gallons.
- Optional internal impact printer for automatic or on-demand reports. Outdoor printer option available.
- Remotely monitor and program via an included RS-232 serial port, from a central location via optional, secured, internal modem, or from a LAN/WAN via optional, secured, internal network interface card. RS-485 port included for connection to Pneumercator "smart" peripherals, such as remote display and annunciator panels.
- Log reports include: Automatic shift inventory, unsupervised deliveries,

closure inputs. Optionally expandable to a total of 6 relays and 6 contact closure inputs OR 18 relays.
- Optionally expandable to 6 or 12 channel analog outputs.

bulk sales, alarms, leak test, water removal, product ordering, and theft logging.
- NEMA 4/4X enclosure options available for harsh or outdoor environments.

The **TMS 2000** surpasses all other inventory management systems by offering three key advantages:

- **First**, it's simple to use. Everyone in your organization will be able to get the information they need at the push of a button.
- **Second**, it's sophisticated. You can get all the information you need, in the form you need, when you need it.
- **Third**, the **TMS 2000** was developed by the best experts in the inventory measurement and management industry, with the future in mind.



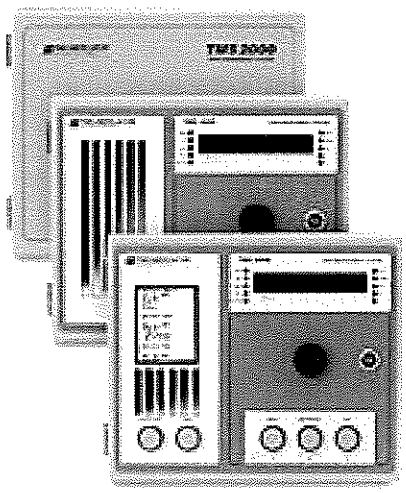
The **TMS 2000** was developed utilizing state-of-the-art technology which offers EPA compliant in-tank leak detection with the following features:

- 0.2 gph monthly testing.
- 0.1 gph precision test.
- 0.2 gph quick test in as little as 2 hours.
- Perform 0.1 gph or 0.2 gph tests with as little as 20% of tank capacity.
- Magnetostrictive level probe and intrinsically safe (IS) discrete sensor capacities; 2 probes with 8 leak sensors.
- Fault detection capable leak sensor inputs using Pneumercator "F" series discrete sensors.
- RS-232 serial port standard. Optional secured, internal modem, FAX/modem, or network interface card. RS-
- Automatic logging of shift inventory, unsupervised deliveries, bulk sales, alarms, leak test, water removal, product ordering, and thefts.
- Access real-time logged and configuration data via RS-232 or modem port using Windows 95 through XP compatible TMSCOMM software.
- Automatic and manual hardcopy reports via optional internal printer. Outdoor printer option available.
- Volumetric computations for steel and fiberglass tanks,

485 peripheral bus standard.
- 2 fully programmable 10 amp 120 VAC relay output contacts and 2 dry contact inputs standard. Optional card provides additional 4 relay contacts, and 4 dry contact inputs, OR 8 relay contacts, and 8 dry contact inputs, OR 16 relay outputs.
- Optional card provides 6 or 12 analog output channels.
- Real-time clock and log memory with battery back-up; Configuration data maintained in EEPROM.
- Superbright, sunlight-readable LED display with discrete LED annunciators for 5 alarm conditions; Leak, Setpoint 1, Setpoint 2, Setpoint 3 and Water.

including manifolded tanks and irregular geometries.
- System configuration can be performed at the site, or remotely via the serial, modem communications port, or network interface.
- "Black box" configuration available for ultra low-cost applications where serial, modem communications, or LAN/WAN are used for collecting acquisition and log data; remote sites or SIR.
- Locking NEMA 12 enclosure standard, optional NEMA 4 or 4X available.
- Back-up generator and oil/water separator applications supported.
- UL approved, file #E139464; CSA approval pending.
- 110/220 VAC operation. DC Input options available.

From our time-proven hydraulic, hydrostatic and direct reading gauges to our state-of-the-art electronic analog, digital and leak detection systems, the technology behind **Pneumercator's** high-performance remote indicating gauges represents the latest in a steady stream of technical advances.



Some of the technology is new, but it is far from untried or unproven. **Pneumercator's** over 99 years of experience encompass significant advances in engineering and electronic design that adapt to the most rigorous environments: ones in which accuracy, reliability and flexibility are a necessity.

Over the years, **Pneumercator** has consistently accommodated the industries' changing requirements. Today we remain

focused in providing quality liquid monitoring systems and look forward to helping you with your present and future needs.

Wayne
A GE Energy Business

RELIANCE® G6200
MECHANICAL FLEET DISPENSER

818 Series
Clock Gauge (Feet & Inches)

EVR

The Morrison "clock gauge" displays the liquid level reading of product stored in an aboveground tank. Measures the liquid level up to a maximum of 12 feet in height.

Features

- Gauge face displays level reading in feet and inches. The hour hand (short hand) displays the number of feet and the minute hand (long hand) accurately displays the number of inches
- Easy to install and calibrate in a 2" tank top opening
- Accurate to ⅛ of an inch
- Easily read from 30 feet away
- Vapor tight construction
- Vapor tight fog free design
- Gauge rotates 360° making it easy for the face to be read from the desired orientation
- Visual indicators for high level (red) and low level (green) are applied to the dial face cover
- Standard float fits through a 2" schedule 40 pipe nipple
- Compatible with Morrison 419 2" drop tube
- Optional drop tube float when used in conjunction with a drop tube, reduces float entanglement when turbulent conditions are present
- **818T and 818FT** series are compatible for use with Diesel Exhaust Fluid (DEF)

818
with standard float

818T
with drop tube float

Item Number	M/F	Float	Weight (lbs)
818---0100 AG	M	Standard	4.50
818---0100AGEVR EVR	M	Standard	4.50
818---0400 AG	M	Drop Tube	4.50
818---0400AGEVR EVR	M	Drop Tube	4.50
818F--0100 AG	F	Standard	4.50
818F--0100AGEVR EVR	F	Standard	4.50
818F--0400 AG	F	Drop Tube	4.50
818F--0400AGEVR EVR	F	Drop Tube	4.50
818T--0100 AG	M	Standard	4.50
818T--0400 AG	M	Drop Tube	4.50
818FT-0400 AG	F	Drop Tube	4.50

**Consult Price List for BSP options.*

Construction Details

818 & 818F
Body... Aluminum
Float... Stainless steel
Cable... Stainless steel

818T & 818FT
Body... Teflon® coated aluminum
Float... Stainless steel
Cable... Stainless steel

515 Series
15 Gallon Remote Spill Containers

The 515 series remote spill container is a 15 gallon capacity cabinet that provides containment of small spills during tank filling operations.

Features
- 15 gallon (56.78 liters) capacity
- Hinged lid opens upward, is lockable, and is held open by a hydraulic arm
- 1″ locking drain valve
- 2″ top opening for hand pump installation
- Single column adjustable base for easy installation
- Female threaded piping entries connect from the back of the container

515

515SD

Construction Details

515
12 gauge steel, powder coated white

515SD
12 gauge stainless steel

Certifications & Listings

Florida DEP EQ 325
Model 515 is ULC listed
Model 515SD is not ULC listed

Item Number	Size	Weight (lbs)
515---0200 AC	2"	155.0
515---0300 AC	3"	155.0
515---0400 AC	4"	158.0
515---2200 AC	2" & 2"	155.0
515---2300 AC	3" & 3"	155.0
515---3200 AC	3" & 2"	155.0
515SD-0200 AC	2"	155.0
515SD-0300 AC	3"	156.0
515SD-0400 AC	4"	157.0
515SD-2200 AC	2" & 2"	159.0
515SD-2300 AC	3" & 3"	160.0

**Consult MBC Customer Service for other options.*

515OEM
15 Gallon Remote Spill Container

The 515OEM remote spill container is a 15 gallon capacity cabinet that provides containment of small spills during tank filling operations.

Features
- 15 gallon (56.78 liters) capacity
- Hinged lid opens upward, is lockable, and is held open by a hydraulic arm
- 1″ locking drain valve
- Four mounting tabs on the back of the unit for easy wall or tank mounting
- Female threaded piping entries connect from the top of the container

515OEM (2″)

Construction Details

Container and lid... 12 gauge steel, powder coated white

Item Number	Size	Weight (lbs)
515OEM0200 AC	2"	145.0
515OEM0300 AC	3"	145.0
515OEM2200 AC	2" & 2"	145.0
515OEM2300 AC	3" & 3"	145.0

**Consult MBC Customer Service for other options.*